Page 1, between lines 4 and 5 has been amended to include the following heading:

TECHNICAL FIELD OF THE INVENTION

Please replace the paragraph beginning on page 1, line 5, with the following rewritten paragraph:

a2

The invention relates to reduction of data traffic and in particular, to the reduction of data traffic between track bound vehicles and devices along a traveled route.

Page 1, between lines 7 and 8 has been amended to include the following heading:

BACKGROUND OF THE INVENTION

Please replace the paragraph beginning on page 1, line 8, with the following rewritten paragraph:

a3

Railway operations are usually controlled and monitored using signal cabins which ensure the safety of the railway traffic. To do this, the signal cabins use a very wide range of track sensors to monitor the locations of the trains moving in the area which they control, and ensure, by means of light signals, that successive trains do not come dangerously close to one another. In addition, signal cabins are used to switch routes for the trains, opposing moves or slanting moves being reliably avoided by means of exclusion and logic-linking procedures. The trains automatically release the parts of the route which they have cleared behind them and make these parts of routes available again for the controlling and monitoring signal cabin.

Please replace the paragraph beginning on page 1, line 22, with the following rewritten paragraph:

Signal-cabin-controlled railway operations are appropriate to use on routes along which multiple trains are intended to travel with the greatest possible density and at the highest possible speed. Signal cabins are indispensable for controlling railway traffic on main routes. However, they require a system on the tracks for determining the position of the vehicles and a centralized system for signaling proceed aspects or travel instructions to the trains.

Please replace the paragraph beginning on page 1, line 31, with the following rewritten paragraphs:

In order to limit the expenditure involved in determining the locations of the trains and signaling travel instructions, decentralized train protection systems, which permit safe journeys without the use of signal cabins have recently been preferred for routes with moderate traffic. In decentralized train protection systems, the trains traveling along the route determine their respective location and transmit the location to decentralized devices along the route. These devices are commonly referred to as track area elements.

Devices along the route are preferably assigned to switches and are addressed by the trains by means of telegrams. The trains register their request to be allowed to travel along the route with the devices using telegrams. The devices along the route check whether there are already applications for opposing moves in the respective route section or whether approvals have already been given for such moves. If this is the case, the request by the vehicle wishing to travel along the route cannot be granted, in which case a message to this effect is transmitted to the requesting vehicles. The vehicle must subsequently stop no later than the point on the route up to which it still has permission to move forward. However, if at the time a train makes a request to a device along the route there has not been any request to the device to assign the route which it administers (or parts of the route) to a train which is moving forward in the opposite

direction, and if a corresponding approval to travel along the route in the opposite direction has not been granted, the device along the route accepts the request originating from the train and assigns permission to the train to travel along the route which it administers. A prerequisite is that the permission to travel along the route has not already been assigned to a train located ahead of the train or that an older request for the assignment of permission to travel along the route is present from there. Permission to travel along the route administered by a device along the route can only be assigned to just one train by each of the devices along the route, a following train cannot travel on the route until the train ahead has completely cleared the route. Opposing moves on the route are not possible until all the trains traveling on this route in the assumed direction have cleared the route administered by the device along the route. In the statement above it has been assumed that between the trains moving in the assumed direction of travel toward the devices along the route there are no branches at which, for example, following trains can leave the track on which more than one train is traveling.

Please replace the paragraph beginning on page 3, line 9, with the following rewritten paragraph:

Vehicles moving along the route determine their respective location along the route, for example using GPS systems, and transmit to the devices along the route appropriate location messages from which devices can determine whether the route sections locked out for the trains are still being traveled along or have already been cleared. In the latter case, a request by another train for assignment of permission to travel along the respective route can then be processed, and, if appropriate, granted. The devices along the route have sufficiently precise information on the location of the route sections occupied by the individual trains if, in addition to appropriate locating information being transmitted by the trains, it is also certain that the trains are complete (i.e. include their usual number of cars). The trains must check this complete state continuously or at least at predefined chronological or spatial intervals and either transmit appropriate

messages to the devices along the route or include these messages in the location messages in some suitable way. The devices along the route then take into account, for the protection of the route, either the actual length of the trains or else they take into account standardized length values.

Please replace the paragraph beginning on page 3, line 33, with the following rewritten paragraph:

In order to, if appropriate, make multiple requests for permission to travel along certain route sections, to continuously transmit permission messages to the vehicles and to continuously transmit location messages so that route sections which have already been cleared are made available at an early point, it is necessary to have very intensive data traffic between the trains and the devices along the route. This data traffic becomes more complex as the number of vehicles or trains passing through the route per time unit increases, the more frequent the updating of the location messages and the greater the precision with which the route is to be subdivided in a virtual fashion in order to maintain intervals between successive trains.

Page 4, between lines 9 and 10 has been amended to include the following heading:

SUMMARY OF THE INVENTION

Please replace the paragraph beginning on page 4, line 10, with the following rewritten paragraph:

The invention reduces the data traffic between the trains traveling along a route and the devices along the route for protecting railway operations.

Please replace the paragraph beginning on page 4, line 14, with the following rewritten paragraph:

In one embodiment of the invention, there is a method for reducing the data traffic between track-bound vehicles traveling along a route and devices along the route. The method includes, for example, registering a vehicle request to be allowed to travel along the route. The vehicles are assigned permission to travel along the route according to predefined rules, the vehicles determining their respective location wherein the vehicles traveling ahead are moved closer to vehicles behind up to their braking distance. The vehicles are virtually coupled and move forward together, but independently of one another, using a vehicle-mounted distance-maintaining system. The devices along the route treat the virtually coupled vehicles as a single vehicle train whose front is determined by the front vehicle of the vehicles which were previously traveling ahead and whose rear is determined by the rear vehicle of the vehicles which were previously traveling behind. According to said features, successive trains are virtually coupled as required, with the result that the devices along the route exchange data, at least on a temporary basis, with, in each case, at least a single train. The devices along the route continue to communicate with the virtual composite train, while the actual individual trains which are present monitor their train integrity and transmit appropriate messages to the train which is communicating with the devices along the route. The trains which are coupled virtually are themselves responsible for maintaining a safe distance between each other, and the distance can be kept relatively small using, for example, radar sensors or else may be, for example, of the order of magnitude of 500 m or more. Virtual coupling of trains which are spaced apart to this extent may be appropriate, for example, if the rear train cannot contact the device along the route for whatever reasons.

On page 4, please delete lines 34-36.

Please replace the paragraph beginning on page 5, line 1, with the following rewritten paragraph:

In one aspect of the invention, more than two successive vehicles/vehicle trains can be coupled to form a virtual composite vehicle train. The method can also advantageously be used in an approach in which in each case more than two trains are virtually coupled to one another and treated in each case as one train by the devices along the route.

Please replace the paragraph beginning on page 5, line 6, with the following rewritten paragraph:

In another aspect of the invention, train integrity checks are performed by the vehicles and appropriate messages are transmitted at least indirectly to the devices along the route. The virtually coupled trains will supply the devices along the route at least indirectly with messages relating to the state of completeness of the virtually coupled trains. This permits the devices along the route to obtain reliable information on the location of the trains on the route, and thus on the occupation of the tracks.

Please replace the paragraph beginning on page 5, line 14, with the following rewritten paragraph:

In still another aspect of the invention, the braking distance, in addition to the relative braking distance of the successive vehicles or the absolute braking distance of the vehicles behind, safety supplements are taken into account at least for the confidence interval of the locating process, as well as data-transmission and data-acknowledgement times. If the aim is to allow trains to follow one another with the greatest possible density, the minimum distance values between the trains resulting from the braking distance should be increased with safety supplements which take into account the confidence interval of the locating process and velocity-dependent distance values for taking into account times for the transmission and acknowledgement of data.

Please replace the paragraph beginning on page 5, line 23, with the following rewritten paragraph:

In yet another aspect of the invention, the virtual coupling of the vehicles is canceled and the devices along the route communicate with the individual vehicles. If the virtual coupling of the trains is to be canceled again, the devices along the route should communicate again with the individual vehicles or vehicle trains and evaluate separately the location messages originating from them.

Please replace the paragraph beginning on page 5, line 29, with the following rewritten paragraph:

In another aspect of the invention, the vehicles communicating with the devices along the route inform the latter about the vehicles which are coupled to them virtually, and in that, in response to the detection of the cancellation of the virtual coupling the devices along the route again request at least separate location messages from the vehicles/vehicle trains following one another for the route sections along which they travel. In still another aspect of the invention, after the cancellation of the virtual coupling, the vehicles which have until now been coupled virtually report to the devices along the route and output at least separate location messages for the route sections along which they travel. The devices along the route will request separate transmission of location messages, or else the vehicles will of their own accord transmit these location messages to the route devices after the virtual coupling has been canceled.

Please replace the paragraph beginning on page 6, line 3, with the following rewritten paragraph:

In yet another aspect of the invention, the virtual coupling of the vehicles is performed or canceled by the vehicles. The virtual coupling of the vehicles is advantageously performed and